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NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1980

Southwest Research Institute
6220 Culebra Road
San Antonio, Texas 78284

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June 1981

Contract Number DLA900-79-C-1266
Annual Technical Report for Period
15 February 1980 — 15 February 1981

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Prepared for

DEFENSE LOGISTICS AGENCY
Headquarters
Cameron Station
Alexandria, Virginia 22314

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ARMY MATERIALS AND MECHANICS RESEARCH CENTER
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During the reporting period, NTIAC's computerized data file grew to approximately 20,000 records. The NTIAC Newsletter was distributed to over 4000 recipients. Ninety-three inquiries (technical, bibliographic, and general) were responded to.

Publications were: NDE Applications of Magnetic Leakage Field Methods, and Technology Assessment of Optical Methods for Nondestructive Evaluation, Part I and Part II. Two drafts on Composite NDE have been prepared.

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NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1980

Southwest Research Institute
6220 Culebra Road
San Antonio, Texas 78284

June 1981

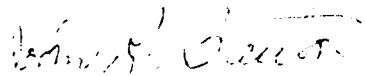
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ARMY MATERIALS AND MECHANICS RESEARCH CENTER
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TABLE OF CONTENTS

	<u>Page</u>
LIST OF FIGURES	iii
LIST OF TABLES	iv
I. INTRODUCTION	1
II. OPERATIONAL REPORT	7
A. Introduction	7
B. Information Support System (ISS)	7
C. Current Awareness and Promotional Activities	14
D. Inquiries	18
E. Technical Publications	22
F. Special Services	22
III. FUTURE PLANS	22
A. Current Awareness and Promotional Activities	22
B. Products and Services	22
IV. APPENDIX A - Contract Status Report (DSAH Forms 1261)	24

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	NTIAC Organization and Staffing	4
2	Southwest Research Institute Organization	5
3	DTIC Support of NTIAC	6
4	Fields Comprising Input Records	12

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Major Current Methods of Nondestructive Testing	2
2	NTIAC Core Journals and Secondary Serial Publications	8
3	Status of the NTIAC Bibliographic Data Base	13
4	1980 Newsletter Circulation	15
5	Current Awareness and Promotional Meetings	17
6	Technical and Bibliographic Inquiries	19
7	Summary of Additional NTIAC File Usage by Other Users	21
8	1980 Publication Sales	23

I. INTRODUCTION

On January 6, 1976, by amendment of contract DSA900-74-C-5268, the Department of Defense transferred to Southwest Research Institute full responsibility for operation of the Nondestructive Testing Information Analysis Center (NTIAC), and discontinued the Nondestructive Testing Data Support Center (NTDSC) as a separate function.

From its establishment in 1961, through 1975, NTIAC was operated by the U.S. Army Materials and Mechanics Research Center, Watertown, Massachusetts. In February, 1974, the Department of Defense supplemented the capabilities of NTIAC through a contractor operated support function designated as the Nondestructive Testing Data Support Center (NTDSC). AMMRC continued, however, to bear responsibility as the officially designated DoD information analysis center in the field of nondestructive testing. Accordingly, AMMRC was charged to provide the interface with the NDT community for services of both NTIAC and NTDSC. During the period from February, 1974, to January, 1976, AMMRC worked closely with NTDSC to develop the latter's capability to function independently as a full service information analysis center of technical excellence. A strong relationship between AMMRC and the now fully contractor operated NTIAC continues with AMMRC being designated as the contracting officer's technical representative responsible for technically monitoring NTIAC activities.

Other major provisions of the contract remain substantially unchanged. Southwest Research Institute is charged to operate NTIAC as a full service information analysis center of technical excellence, which includes principally: establishing and continuously maintaining an information support system that is comprehensive and current with respect to the field of nondestructive testing; responding to inquiries for technical or bibliographic information; publication of a current awareness periodical (the NTIAC Newsletter); and, in response to needs of the user community, preparation, publication, and marketing of timely, authoritative critical reviews, technology assessments, state-of-the-art surveys, data books, and handbooks.

In common with other DoD IAC's, NTIAC is required to establish and maintain a service charge system for its products and services with the goal of achieving an annual rate of reimbursement equal to at least 50 percent of yearly direct funding.

The technical scope of NTIAC is that of the entire field of nondestructive testing, inspection, and evaluation--the full range of methods and techniques whereby a material, component, or entire system can be so characterized as to reliably predict its performance under a prescribed service regime. Table 1 indicates major current methods of nondestructive testing.

Table 1

MAJOR CURRENT METHODS OF NONDESTRUCTIVE TESTING

. RADIOGRAPHIC AND RADIOMETRIC TESTING

X-Rays
Gamma Rays
Neutrons
Filmless Techniques

. ELECTROMAGNETIC TESTING

Eddy Currents
RF Fields
Microwaves
Magnetic Flux Analysis
Magnetic Particles

. ULTRASONIC AND ACOUSTIC TESTING

Ultrasonic Transmission and Reflectometry
Ultrasonic Imaging
Spectrum Analysis
Acoustic Emission

. LIQUID PENETRANT TESTING

Dye Penetrants
Fluorescent Penetrants

. OPTICAL TESTING

Visual Testing
Optical Reflectometry and Transmission
Holography

. THERMAL TESTING

Infrared Radiometry
Thermography

The present organization and personnel of NTIAC are shown in Figure 1. By design, NTIAC is supported by the full resources of its host organization, Southwest Research Institute, the organizational chart of which is shown in Figure 2. Of the total Institute staff of 2000, approximately 200 professional staff constitute the resource of knowledge and expertise which can directly support NTIAC in its publications and information support systems.

In an important respect NTIAC is unique among DoD IAC's. It is the first IAC which was planned from the beginning to rely upon the Defense Technical Information Center for automatic data processing (computer) services, as well as certain other essential support services. These are indicated in Figure 3.

In Chapter II the state of development of NTIAC's basic performance areas are summarized. In Chapter III, plans and projections for the eighth year of operation are presented. The Appendices include statistical summaries, DSAH Form 1261, for the fourth quarter and cumulative summary, of the seventh contract year, and cumulative summary since initiation of the current contract.

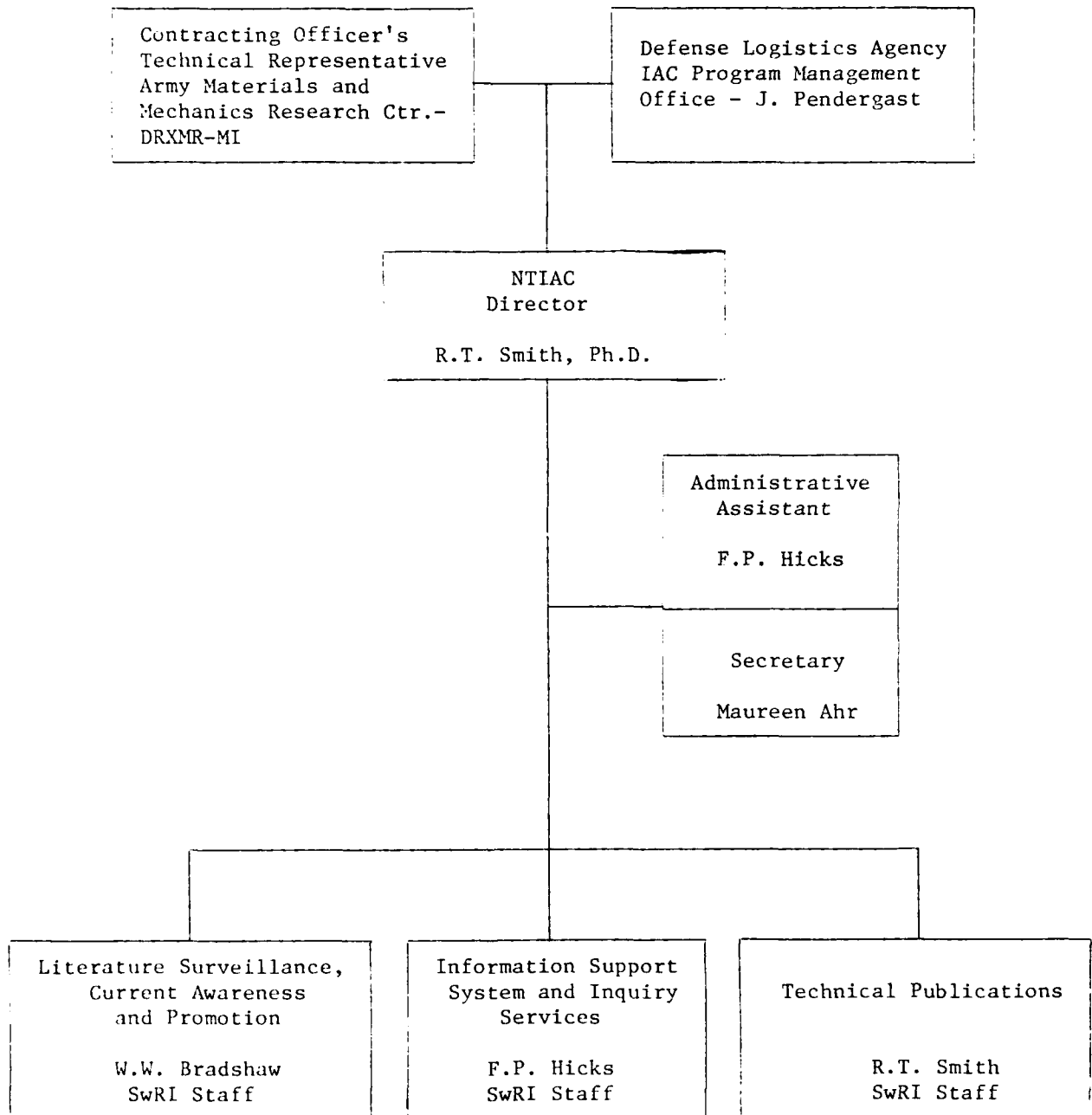
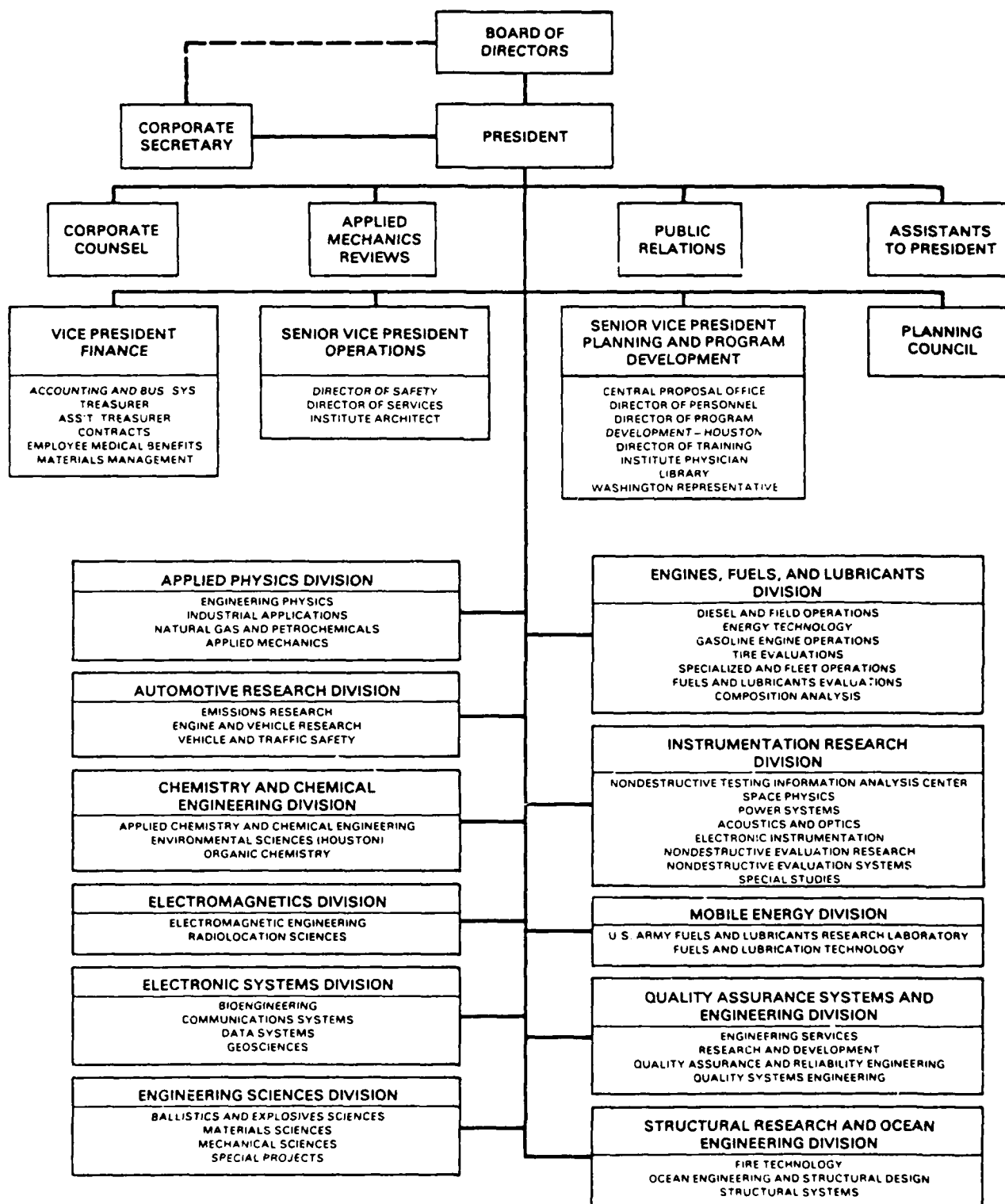


Figure 1

NTIAC ORGANIZATION AND STAFFING

SOUTHWEST RESEARCH INSTITUTE ORGANIZATION CHART



STANDING COMMITTEES

ARCHITECTURAL COMMITTEE
SERVICES COMMITTEE
COMPUTER COMMITTEE
ENERGY CONSERVATION COUNCIL
LIBRARY COMMITTEE
MANAGEMENT ADVISORY COMMITTEE
NUCLEAR QUALITY ASSURANCE COMMITTEE
PATENT COMMITTEE
PLANNING COUNCIL

RADIOLOGICAL HEALTH & SAFETY COMMITTEE
REVIEW COMMITTEE ON THE USE OF HUMAN SUBJECTS
SAFETY COMMITTEE
EF & L COMMITTEE
TRANSPORTATION SAFETY RESEARCH COMMITTEE
STRUCTURAL LIFETIME ASSURANCE COMMITTEE

— DIRECTION
- - - COORDINATION
REVISED APRIL 1980

FIGURE 2

DTIC SUPPORT OF NTIAC

- . RDT&E On-Line System Terminal
- . TR-File; WU-File; R&DPP-File
- . Unique NTIAC File & Inverted (Index) File
- . Batch Input Service
- . Off-Line Print-Out Service
- . Special Output Format
- . Hard Copy Print-Out and Indices of NTIAC File
- . Selected Dissemination of Information Program

Figure 3

II. OPERATIONAL REPORT

A. Introduction

The major areas of NTIAC's activity are: the information support system; current awareness and promotional activities; technical and bibliographic inquiries; technical publications; and special services. The status of each of these areas is reviewed in this chapter.

B. Information Support System (ISS)

NTIAC's ISS comprises a document collection and computerized bibliographic data files. These are kept current through systematic surveillance of the worldwide literature in nondestructive testing and closely allied technical areas.

Surveillance of open literature is accomplished in two basic modes. The most important serial literature, books, conference proceedings, etc., is directly scanned. The "core" literature comprises those serials of which a significant fraction of the contents is ordinarily accessioned. The secondary literature comprises those serials which are also directly reviewed cover to cover, but from which only selected pertinent articles are accessioned. Table 2 lists the current core and secondary serials, which has been greatly expanded during this contract year. As an added check on our surveillance effectiveness, we also scan Current Contents, NASA/SCAN, as well as the monthly Engineering Index and Science Abstracts. New books, conference proceedings, etc., are surveiled through informal channels, publishers' advertisements and catalogues, and reviews published elsewhere. It is noteworthy that all serial publications, books, proceedings, etc., are furnished to NTIAC by its host institution, Southwest Research Institute, through the Institute's Library, without direct charge. (Exceptions are specific purchases made especially for NTIAC; such items become the property of NTIAC, i.e., of the U.S. Government).

Surveillance of Department of Defense technical reports is accomplished by direct receipt of reports (where NTIAC has been placed on the primary distribution list) and the current awareness service provided by the Defense Documentation Center. A copy (in either ink print or microfiche) of each accessioned report is added to the NTIAC document collection.

Other U.S. Government reports and unpublished private sector reports are surveiled mainly by requesting copies through informal contacts with agencies and individuals engaged in nondestructive testing programs. Additionally, commercially available "dial up" bibliographic data files (mainly the NTIS file) are periodically searched for NDE related citations. This gives good coverage of publicly released U.S. Government reports, especially those of NASA, which are comparatively rich in the area of NDE.

Southwest Research Institute utilizes a General Electric "Terminet 30" data communications terminal with remote batch print-out capability. This terminal is shared by the SwRI Library and NTIAC and is located in the NTIAC offices along with the DDC terminal and printer, making the overall operations convenient and efficacious. The use of this equipment for broader periodic searches of commercially available computerized data bases further ensures the adequacy of NTIAC's surveillance of the literature.

Table 2

NTIAC CORE JOURNALS

1. Acoustical Imaging and Holography: An International Interdisciplinary Journal (USA)
2. British Journal of Non-Destructive Testing (GB)
3. Institute of Electronics and Electrical Engineers, Transactions Acoustics, Speech, and Signal Processing (USA)
4. Institute of Electronics and Electrical Engineers, Transactions Instrumentation and Measurement (USA)
5. Institute of Electronics and Electrical Engineers, Transactions Sonics and Ultrasonics (USA)
6. Journal of Nondestructive Evaluation (USA)
7. Journal of the Acoustical Society of America (USA)
8. Journal of Testing and Evaluation (USA)
9. Materialprüfung (Ger.)
10. Materials Evaluation (USA)
11. NDT International (GB)
12. Soviet Journal of Nondestructive Testing (USSR)
13. Ultrasonics (GB)

SECONDARY SERIAL PUBLICATIONS
SURVEILLED AND REVIEWED BY NTIAC

1. Academie Polonaise des Sciences Bulletin (France)
2. Acustica (Ger.)
3. Aircraft Engineering (GB)
4. American Ceramic Society Bulletin (USA)
5. American Ceramic Society Journal (USA)
6. American Concrete Institute Journal (USA)
7. American Journal of Physics (USA)
8. American Laboratory (USA)
9. Applied Acoustics (Netherlands)
10. Applied Optics (USA)
11. Applied Physics (Ger.)
12. Applied Physics (USA)
13. Applied Physics Letters (USA)
14. Applied Scientific Research (Netherlands)
15. ASTM Standardization News (USA)
16. Automatica (GB)
17. Automatic Control & Computer Sciences (USSR)
18. The Bell System Technical Journal (USA)
19. Canadian Aeronautics and Space Journal (Canada)
20. Canadian Journal of Physics (Canada)
21. Ceramic Engineering & Science Proceedings (USA)
22. Composites (GB)
23. Composites Technology Review (USA)
24. Control Engineering (USA)
25. Defense Management Journal (USA)

Table 2 (Cont'd.)

26. Electro-Mechanical Design (USA)
27. Electronic Engineering (GB)
28. Electronics Letters (GB)
29. Electro-Optical Systems Design (USA)
30. Engineering Fracture Mechanics (USA)
31. Engineering Index (USA)
32. EPRI Journal (USA)
33. European Scientific Notes (GB, ONR)
34. Experimental Mechanics (USA)
35. Geotechnical Testing Journal (USA)
36. Industrial Electronics and Control Instrumentation IEEE (USA)
37. Industrial Laboratory (USSR)
38. Industrial Research and Development (USA)
39. Industrial Robotics (GB)
40. IEEE Transactions on Pattern Analysis & Machine Intelligence (USA)
41. Instruments and Experimental Techniques (USSR)
42. International Journal of Fracture (Netherlands)
43. International Journal of Pressure Vessels & Piping (GB)
44. International Journal of Solids & Structures (GB)
45. International Metals Reviews (GB)
46. Japanese Journal of Applied Physics (Japan)
47. Journal of Applied Mechanics, Transactions of ASME (USA)
48. Journal of Applied Physics (USA)
49. Journal of Composite Materials (USA)
50. Journal of Dynamic Systems, Measurement and Control, ASME (USA)
51. Journal of Engineering Materials and Technology, ASME (USA)
52. Journal of Engineering for Power, Transactions of ASME (USA)
53. Journal of Materials Science (GB)
54. Journal of the Physical Society of Japan (Japan)
55. Journal of Physics, D Applied Physics (GB)
56. Journal of Physics , E Scientific Institutes (GB)
57. Journal of Pressure Vessel Technology of ASME (USA)
58. Journal of Research, NBS (USA)
59. Journal of Sound & Vibration (GB)
60. Journal of Strain Analysis (GB)
61. Materials Engineering (USA)
62. Materials Performance (USA)
63. Materials Research Bulletin (GB)
64. Materials Science and Engineering (Switzerland)
65. Measurement Techniques (USSR)
66. Mechanics of Composite Materials (USSR)
67. Messen Prüfen (Ger.)
68. Metal Construction (GB)
69. Metals & Materials (GB)
70. Metal Progress (USA)
71. Metal Science (GB)
72. Metals Technology (GB)
73. Nondestructive Testing (Australia)
74. Nuclear News (USA)
75. Optical Engineering (USA)
76. Optical Society of America Journal (USA)
77. Optics and Spectroscopy (USSR)
78. Optics Letters (USA)
79. Philosophical Magazine A (GB)
80. Physics A, B, C, & D (Netherlands)

Table 2 (Cont'd.)

81. Physics Letters, A, B, & C (Netherlands)
82. Physics of Metals & Metallography (USSR)
83. Progress in Materials Science (GB)
84. Quality (USA)
85. RCA Review (USA)
86. Review of Scientific Instruments (USA)
87. Robotics Today (USA)
88. Russian Engineering Journal (USSR)
89. SAMPE (USA)
90. SAMPE Journal (USA)
91. SAMPE Quarterly (USA)
92. Science Abstracts, Series A, B, and C (GB)
93. Soviet Applied Mechanics (USSR)
94. Soviet Journal of Optical Technology (USSR)
95. Soviet Physics Acoustic (USSR)
96. Soviet Physics Doklady (USSR)
97. Soviet Physics JEPT (USSR)
98. Soviet Physics Journal (USSR)
99. Soviet Physics Technical Physics (USSR)
100. Strength of Materials (USSR)
101. Strain (GB)
102. Ultrasonic Imaging (USA)
103. Wear (Netherlands)
104. Welding Journal (USA)

For each of the items accessioned by NTIAC, a computerized bibliographic record is created. Each such record comprises the pertinent fields, illustrated in Figure 4. Index terms (descriptors) are taken from a controlled word list prepared by NTIAC; this list is updated at least semiannually. In those cases where a bibliographic record already exists in the Technical Report file at DTIC, NTIAC augments the DTIC record by adding the NTIAC accession number and descriptors, thus effectively bringing such records into the NTIAC file.

The current status of NTIAC's bibliographic data file is presented in Table 3.

In addition to its own unique bibliographic data file, NTIAC also has access, through its RDT&E on-line terminal, to DTIC's Technical Report File (based on DD Form 1473), the Work Unit File (based on DD Form 1498), and the R&D Program Planning File (based on DD Form 1634).

Significant changes that have taken place during the past year are: the revised validation system at DTIC which permits unclassified sites to display/batch unclassified citations for classified reports; PLASTEC's data base became available to all users; the Metal Matrix IAC contract was awarded to GE TEMPO at Santa Barbara, and they will input citations to the TR data base.

The IAC files have been available to all users for a little over a year now. The greatest impact on NTIAC has been an increased amount of requests for documents. Most users think NTIAC supplies documents in spite of our continued attempts to explain this policy. We anticipate that these requests will become less as users become more familiar with the IAC's.

At the Annual RDT&E User's Conference, Fran Hicks, NTIAC, Helen Pestel, MCIC, Vakare Valaitis, GACIAC, and Fred Anzalone, PLASTEC, explained the objectives and mission of the IAC's as well as how to best search each of the data bases.

During this past year, we have nearly completed the file maintenance project, which is the updating of the approximately 6000 records received from AMMRC. Approximately 45 records remain to be dealt with. We expect to have this task completed within the next quarter, at which time all the NTIAC on-line records will contain complete and accurate data.

In December NTIAC's UNIVAC 100 terminal and 800 printer were replaced by the 200 terminal and the 986 printer. This new equipment is faster and more efficient than the old equipment was. We are evaluating the advantage of using the tape cassette which we may request in the coming year.

NTIAC		LITERATURE REVIEW WORKSHEET		(42) NT- 10959 (1) AD- D301672
(6) Title	Nuclear Resonances in Metals			
(10) Authors:	I. D. Weisman, L. J. Swartzendruber, L. H. Bennett		(8)	
(22) Availability:	Published in Techniques of Metals Research; Vol. 1, Pt. 2; 1973; Chapter 9; 165-504		(20)	
(21) Sup. Note:	See also NT-8281		(33) Code:	1, 21
			(43) Copy:	1
			(11) Date:	1973
			(12) No.pp:	340
(35) Source Code:	(14) Source Series:			
(15) Contract:	(18) Mon. Acronym:	(19) Mon. Series:		
(9) Descr. Note:	(34) Serial Descr.:			
(30) Annotation:	Authoritative. Advanced discussion.			
(28)				
(27) Abstract:	<p>A general review of theory, experimental apparatus and technique, and representative results of nuclear resonances in metals. Covers continuous-wave and pulsed NMR, nuclear quadrupole resonance (NQR), NMR in ferromagnetic materials (FNR), the Mossbauer effect, and combined resonances (the Overhauser effect), acoustic modulation of Mossbauer spectra, nuclear magnetic acoustic resonance, helicon waves, and electron-nucleus double resonance. Also discussed are thermal effects, sample size and shape effects, diffusion, spurious resonances, calorimetric detection of NMR, and NMR in superconductors. (NTIAC)</p>			
(44) Descriptors:	<p>*Nuclear magnetic resonance, *Nuclear quadrupole resonance,</p> <p>*Mossbauer effect, test book, reviews, acoustic nuclear resonance</p>			
Other key words:	Date Input:			
	Indexer:			

Figure 4

Table 3

STATUS OF THE NTIAC BIBLIOGRAPHIC DATA BASE

15 February 1980 - 15 February 1981

Documents in File	19,997
Records Unique to NTIAC	16,559
Records Shared by DTIC	3,438

C. Current Awareness and Promotional Activities

During 1980, the NTIAC Newsletter circulation exhibited a slow but definite increase: from 4,229 in February, 1980, to 4,418 in February, 1981.

The NTIAC Newsletter continues to be well received by the NDT community. For each issue the Feature article topic is given below.

<u>ISSUE</u>	<u>FEATURE</u>
January	Quantitative Nondestructive Inspection for Retirement-for Cause
February	Neutrons in Nondestructive Evaluation Ranging from the Detection of Hydrogen Embrittlement to the Use of Neutrons in Several Types of Radiography
March	The Shadow Technique, a new method for ultrasonic inspection which makes possible the inspection of materials and parts considered non-inspectable due to coupling problems, surface conditions, grain size, or geometry and an article on the infrared inspection of printed circuits
April	The several services of NTIAC including technical inquiries, bibliographic services, and the NTIAC publications available on various types of nondestructive test methods
May	Acoustical Real-Time Imaging and carried the first announcement of the 13th Symposium on Nondestructive Evaluation
June	Introduced a new NTIAC publication, "The Economics of Nondestructive Evaluation, a Bibliography", and an article on "Neutron Radiography of Aircraft Structures"
July	A brief article on the difficulties of applying oil analysis methods to large Army vehicles and carried a rather long calendar
August	"Call for Papers" for the 13th Symposium on Nondestructive Evaluation, and a convenient order form for obtaining NTIAC publications
September	Editorial on the front page soliciting short articles on Nondestructive Evaluation from NTIAC Newsletter readers

Table 4
1980 NEWSLETTER CIRCULATION

Army	181
Navy	210
Air Force	176
DoD Non-Service	66
Other Government	166
Foreign	167
Foreign Government	53
U.S. Private Sector	<u>3399</u>
TOTAL	4418

October	Discussed NTIAC services and products and published a short article on a new journal, The Journal of Nondestructive Evaluation
November	Featured a synopsis of a paper by Alex Vary on Quantitative Ultrasonic Evaluation of Engineering Properties of Metals, Composites, and Ceramics
December	Featured an article on the stress screening of electronic components and assemblies, whereby faulty parts and assemblies are discovered before they are installed in electronic devices or systems
January 1981	Featured "Maintenance Troubleshooting" with sensitive ultrasonic equipment
February 1981	Featured the first article submitted for publication in the Newsletter following the editorial asking for short articles on nondestructive evaluation. Also, Published the Tentative Program for the 13th Symposium on Nondestructive Evaluation.

Table 5 summarizes NTIAC current awareness participation at promotional briefings and displays at various conferences and meetings during the past year.

On March 24-27, Dr. Smith attended the 1980 Spring Conference of the ASNT, and on March 13 visited the Materials Laboratories of Dr. Harris Marcus at the University of Texas, Austin.

The Regional User's Meeting was attended by Frances Hicks on February 27-28, held at Hughes Aircraft Company in El Segundo, California.

On May 16, Dr. Smith attended a seminar on Advanced Nondestructive Inspection held at Southern Methodist University in Dallas. In the afternoon of this session, he conducted a workshop on needed NDI technical services in the Dallas/Ft. Worth area, and discussed NDI informational services. Copies of the User's Guide were distributed at the Seminar, attended by approximately 160 people.

On June 4-6, Dr. Smith attended the Second International Symposium on Ultrasonic Materials Characterization, sponsored by the National Bureau of Standards, and held at Gaithersburg, Maryland.

On July 13-18, Dr. Smith attended the Air Force/Rockwell Conference on Quantitative NDE. Both User's Guides and samples of the NTIAC Newsletters were distributed at the Conference, held at La Jolla, California.

On September 3-5, Dr. Smith attended the DLA/IAC Conference and Workshop, held at the NRL Auditorium in Washington, D.C.

Table 5

CURRENT AWARENESS & PROMOTIONAL MEETINGS

For Period 15 February 1980 through 15 February 1981

<u>MEETING</u>	<u>DATE/PLACE</u>
University of Texas at Austin Materials Laboratory	March 13, 1980 Austin, TX
ASNT Spring Conference & Exhibit	March 24-27, 1980 Philadelphia, PA
RDT&E Users Conference (F. Hicks)	February 27-28, 1980 El Segundo, CA
SMU Seminar on Advanced NDE	May 16, 1980 Dallas, TX
Second International Symposium on Ultrasonic Materials Characterization	June 4-6, 1980 Gaithersburg, MD
AF/Rockwell Quantitative NDE Conference	July 13-18, 1980 La Jolla, CA
DLA/IAC Conference & Workshop	September 3-5, 1980 Washington, D.C.
Conference on Mechanics of NDT	September 10-12, 1980 Blacksburg, VA
ASNT National Fall Conference & Exhibit	October 6-9, 1980 Houston, TX
EPRI Annual RDE Review	October 22-23, 1980 Palo Alto, CA
ASTM Committee E-7 (NDE) Meeting	January 26-29, 1981 Ft. Lauderdale, FL

The Conference on Mechanics of Nondestructive Testing sponsored by Virginia Polytechnic Institute, held September 10-12, was attended by Dr. Smith. Both NTIAC User's Guides and sample copies of the Newsletter were distributed.

A most successful NTIAC exhibit was held at the ASNT 40th National Fall Conference and Quality Testing Show held at the Shamrock-Hilton Hotel, October 6-9, Houston, Texas. During the show, NTIAC distributed sample copies of the Newsletter and gained 71 new Newsletter subscriptions.

On October 22-23, the Electric Power Research Institute held their Second Annual NDE Information Meeting at Rickey's Hyatt House in Palo Alto, California. Dr. Smith represented NTIAC at this meeting and distributed copies of the NTIAC User's Guide and samples of the Newsletter to the participants.

On January 26-29, Dr. Smith attended the ASTM Meeting of Committee E-7 on Nondestructive Testing, held at Ft. Lauderdale, Florida.

NTIAC is receiving excellent support from ASNT in the area of publicizing our products, and is supplying a substantial number of copies of our products wholesale to ASNT for resale. Many of our products are now routinely and continuously advertised along with other important ASNT offerings.

Visitors to NTIAC during the reporting period included Mr. Hugh Sauter, Administrator of DTIC, Mr. T. A. Castellaw, Staff Mechanical Engineer of Prescon Corporation, and Mr. Setuo Shimiyu, of the Pokushu Tokyo Company, Tokyo, Japan (one of our wholesalers). Another visitor was Mr. Charles Martin, and Dr. W. A. Hane of Boeing Aerospace Corporation, Seattle, Washington. The NTIAC Program Manager, Mr. James Pendergast of DLA, and Mr. George Darcy, Technical Monitor, visited us on June 18th for our annual review.

D. Inquiries

During this reporting period, NTIAC responded to 95 inquiries. Twenty-four bibliographies were delivered and revenue collected amounted to \$3,590. Twelve inquiries were received from government agencies.

Charges continue to be a deterrent to utilization by government agencies. Also, it appears that an increasing number of government offices are gaining access to DTIC's records by their own on-line equipment. A significant number of calls have been received concerning NTIAC's data base; requests for assistance with on-line searching, requests for sources of documents, and requests for information about the contents of the data base comprise the subjects of these calls. These calls of a general nature have been too numerous to report individually.

Table 6 summarizes the technical and bibliographical inquiry activity, while Table 7 lists usage of our files by others. It is interesting and gratifying to note the relatively large number of orders for NTIAC-indexed information by industry, which probably represents the largest potential user of our files.

Table 6

TECHNICAL AND BIBLIOGRAPHIC INQUIRIES

<u>No.</u>	<u>Source</u>	<u>Type</u>	<u>Amount</u>	<u>Date</u>
0507	SwRI	Bibliography	\$ n/c	2/19/80
0508	SwRI	Bibliography	n/c	2/19/80
0509	Mary Mace	Req. for Publ.	n/c	2/26/80
0510	Navy	Req. for Publ.	n/c	2/26/80
0511	C.H. Blackerby	Tech. Inquiry	n/c	3/02/80
0512	Mech. Tech. Inc.	Service Info.	n/c	2/29/80
0513	Marley Organization	Service Info.	n/c	3/04/80
0514	SwRI	Bibliography	90	3/07/80
0515	SwRI	Bibliography	385	3/07/80
0516	United Nuclear	Bibliography	100	3/17/80
0517	SwRI	Bibliography	90	3/12/80
0518	RHP Bearing Research	Req. for Publ.	n/c	3/17/80
0519	SwRI	Bibliography	110	3/19/80
0520	Lockheed	Bibliography	n/c	3/31/80
0521	SwRI	Bibliography	90	4/01/80
0522	Varian Associates	Tech. Inquiry	n/c	4/01/80
0523	General Electric	Req. for Publ.	n/c	4/02/80
0524	U. S. Dept. of Agriculture	Tech. Inquiry	n/c	4/02/80
0525	Cribbs Consultants	Service Info.	n/c	4/02/80
0526	Pentagon (Tedesco)	Req. for Reference	n/c	4/14/80
0527	Aerospace Corporation	Req. for Reference	n/c	4/15/80
0528	TRW, Inc.	Service Info.	n/c	4/24/80
0529	Acoustic Emissions	Service Info.	n/c	5/08/80
0530	General Electric	Service Info.	n/c	5/09/80
0531	SwRI	Service Info.	n/c	5/15/80
0532	Bendix Corp.	Tech. Inquiry	n/c	5/20/80
0533	Los Alamos Scientific Lab	Cost Info.	n/c	5/22/80
0534	Elson T. Killam Assoc.	Bibliography	100	5/22/80
0535	Leon Weiner, Houston	Tech. Info.	n/c	5/22/80
0536	Los Alamos Scientific Lab	Annotated Bib.	615	5/22/80
0537	SwRI - Div. 17	Cost Info.	n/c	6/02/80
0538	DuPont de Nemours	Cost Info.	n/c	6/05/80
0539	AET	Tech. Info.	n/c	6/09/80
0540	AiResearch Mfg.	Cost Info.	n/c	6/09/80
0541	SwRI - Div. 15	Rept. Locating	n/c	6/10/80
0542	General Dynamics	Tech. Info.	n/c	6/10/80
0543	SwRI - Div. 15	Bibliography	125	6/17/80
0544	NASA - Goddard	Tech. Info.	n/c	6/18/80
0545	AMMRC	Bibliography	n/c	6/18/80
0546	Newport News Shipbuilding	Tech. Info.	n/c	7/08/80
0547	Office of Naval Research	Tech. Info.	n/c	6/24/80
0548	SwRI - Div. 17	Bibliography	90	6/27/80
0549	Reynolds Aluminum	Report Info.	n/c	6/27/80
0550	Tesco Corp.	Report Info.	n/c	7/08/80

Table 6 (Cont'd.)

<u>No.</u>	<u>Source</u>	<u>Type</u>	<u>Amount</u>	<u>Date</u>
0551	Hebrew Univ. of Jerusalem	Proposal	\$ n/c	7/09/80
0552	SwRI - Div. 02	Bibliography	90	7/15/80
0553	SwRI - Div. 15	Info. n/finds	n/c	7/16/80
0554	SwRI - Div. 17	Bibliography	105	7/17/80
0555	General Electric	Report Info.	n/c	7/17/80
0556	Ashley-Butler	Tech. Info.	n/c	7/23/80
0557	SwRI - Div. 15	Bibliography	n/c	7/24/80
0558	SwRI - Div. 14	No finds	n/c	7/24/80
0559	Northrop	Tech. Info.	n/c	7/27/80
0560	Magnaflux	Report	n/c	7/29/80
0561	Fort Eustis	Tech. Info.	n/c	7/30/80
0562	Prescon	Annotated Bib.	315	8/12/80
0563	SwRI	Bibliography	n/c	8/15/80
0564	Rolls Royce	Tech. Info.	n/c	8/18/80
0565	NRC, Canada	Service Info.	n/c	8/26/80
0566	Bell & Howell	Tech. Info.	n/c	9/04/80
0567	SwRI	Bibliography	105	9/04/80
0568	GE	Tech. Info.	n/c	9/09/80
0569	SwRI	Bibliography	80	9/23/80
0570	Litton	Service Info.	n/c	9/30/80
0571	SwRI	Bibliography	80	10/01/80
0572	Columbia Research	Service Info.	n/c	10/02/80
0573	SwRI	Bibliography	80	10/02/80
0574	White Consultants	Tech. Info.	n/c	10/06/80
0575	Sandia	Tech. Info.	n/c	10/09/80
0576	SwRI	Bibliography	100	10/14/80
0577	Olympus Corp.	Service Info.	n/c	10/15/80
0578	Kelly Field	Tech. Info.	n/c	10/17/80
0579	SwRI	Bibliography	105	10/23/80
0580	Texas A&M	Bibliography	100	11/03/80
0581	NSWC	Tech. Info.	n/c	11/03/80
0582	Soil & Material Eng.	Bibliography	n/c	11/04/80
0583	SwRI	Bibliography	120	11/04/80
0584	SwRI	Bibliography	120	11/18/80
0585	Martin Marietta	Service Info.	n/c	11/26/80
0586	Defense Contract Audit Agency	Service Info.	n/c	12/16/80
0587	SwRI	Bibliography	105	1/05/81
0588	AMMRC	Bibliography	n/c	1/06/81
0589	Phil Watkins	Tech. Info.	20	1/07/81
0590	Drexel Univ.	Cost Info.	n/c	1/15/81
0591	Industrial NDT Co.	Tech. Info.	n/c	1/16/81
0592	Beattie Tech. School	Tech. Info.	n/c	1/20/81
0593	Peabody International	Serv. Info.	n/c	1/21/81
0594	SwRI	Prelim. Srch.	n/c	2/10/81
0595	BMK Services	Tech. Info.	n/c	2/18/81
0596	AMMRC	Bibliography	n/c	2/18/81
0597	SwRI	Prelim. Srch.	n/c	2/18/81
0598	Naval Weapons Lab	Tech. Info.	n/c	2/20/81
0599	Drexel Univ.	Bibliography	340	2/25/81
0600	Honeywell	Serv. Info.	n/c	2/25/81

Table 7

SUMMARY OF ADDITIONAL NTIAC FILE USAGE BY OTHER USERS

1 January 1980 - 28 February 1981

<u>User</u>	<u>Displays</u>	<u>Orders</u>
Navy	715	195
Army	966	148
Air Force	511	33
Other Government	192	11
Industrial	539	1727
DTIC	1374	62
Other IAC's	499	5

E. Technical Publications

During this reporting period three new state-of-the-art surveys have been published. These are NDE Applications of Magnetic Leakage Field Methods, and Technology Assessment of Optical Methods for Nondestructive Evaluation, Part I and Part II. A draft of a state-of-the-art survey Nondestructive Evaluation of Fiber Reinforced Composites - Volume I, NDE of Graphite Fiber Reinforced Plastic Composites (Part I, Radiography and Ultrasonics) was drafted and approved for publication. It is now in press.

Publications sold during this reporting period are as shown in Table 8.

It should be noted that NTIAC is now handling the sales of available back issues on the Symposia on Nondestructive Evaluation held biannually at San Antonio, Texas, and now sponsored by NTIAC.

F. Special Services

During this period NTIAC has organized the forthcoming 13th Symposium on Nondestructive Evaluation. The keynote speaker will be Dr. Arden Bement, formerly Under-Secretary, within the Department of Defense, for research and engineering, and the luncheon speaker will be Mr. George Wheeler, National Secretary of ASNT. We will have approximately 40 technical papers on the program, together with 3 special sessions organized by George Birnbaum of the National Bureau of Standards (on calibration and standards), Mr. George Darcy of AMMRC (a panel session on government plans and programs), and Mr. Chuck McGogney of the Department of Transportation (on residual stress measurements). NTIAC will publish a Proceedings of the Conference.

III. FUTURE PLANS

A. Current Awareness and Promotional Activities

NTIAC will be represented at the Spring ASNT meeting and the Fall General ASNT meeting. As mentioned above, NTIAC will be operating the 13th Symposium on Nondestructive Evaluation to be held in San Antonio, April 21-23 of 1981. Dr. Smith will be presenting a paper on NTIAC and its contributions to effective materials utilization, at the Interamerican Conference on Material Technology to be held at Mexico City in October of 1981.

B. Products and Services

During the coming year the NTIAC Handbook update is being continued, and publication of several state-of-the-art surveys will be accomplished. One of these is a state-of-the-art survey on the NDE of composites. Other possible candidates include an update of advanced ultrasonic systems and automated radiography.

We are continuing to prepare prepackage bibliographies on selected topics of unusually wide interest and importance to the user community. The second of these to be offered will be one on fracture mechanics and NDE.

Table 8

1980 PUBLICATION SALES

<u>Publication</u>	<u>Title</u>	<u>Sales</u>
NTIAC 76-1	Electromagnetic Acoustic Transducers	48
NTIAC 76-2	Proceedings of a Workshop on NDE of Residual Stress	13
NTIAC 77-1	Advanced Ultrasonic Testing Systems	169
NTIAC 78-1	Automated Radiography	59
NTIAC 78-2	Liquid Crystals for NDE	33
NTIAC 79-1	NTIAC Handbook	42
NTIAC 79-2	Barkhausen Effect	53
NTIAC 79-3	Bibliography on Economics of NDE	43
NTIAC 80-1	NDE Applications of Magnetic Leakage	117
NTIAC 80-2	Technology Assessment of Optical Methods	66
	Proceedings of 12th Symposium	54
	Proceedings of 2nd through 11th Symposia	19

APPENDIX

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT		NAME OF INFORMATION ANALYSIS CENTER Testing Information Analysis Center				Nondestructive		QUARTER ENDING 15 February 1981		CUMULATIVE THRU	
AREA TITLE		OUTPUT UNITS PRODUCED		MANHOURS EXPENDED		TOTAL		COSTS INCURRED		INCOME	
				PRO- FESSIONAL	NON-PRO- FESSIONAL			DIRECT	INDIRECT	TOTAL	
1. ACQUISITION AND INPUT OF SOURCE INFORMATION				382	341	723	12,258	16,639	28,897		
a. DOCUMENTS ACQUIRED		1,062									
b. DOCUMENTS REVIEWED		1,062									
c. DOCUMENTS CATALOGED		698									
2. TECHNICAL INQUIRY RESPONSES PROVIDED		5	2	-	-	2	<20>	40	20	46	
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED		5	14	12		26	<873>	409	<464>	1,367	
4. HANDBOOKS' DATA BOOKS COMPLETED			100	-		100	1,285	2,597	3,882	540	
a. NEW CHAPTERS/PAGES COMPLETED		-									
b. REVISED CHAPTERS/PAGES COMPLETED		-									
c. DATA SETS COMPILED		-									
5. STATE-OF-THE-ART STUDIES COMPLETED		-	-	48		48	<620>	725	105	2,066	
f. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED		-	-	-	-	-	<1,446>	<1>	<1,447>	1,443	
7. CURRENT AWARENESS AND PROMOTION EFFORTS			376	408.5		784.5	10,879	11,140	22,019	1,109	
g. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED		12,873									
h. NUMBER MEETINGS CONFERENCES, ETC SUPPORTED		1									
8 OTHER		-	-	-	-	-	-	-	-	-	
9 MANAGEMENT AND SUPPORT			100	-		100	2,798	3,750	6,548		
10 UNASSIGNABLE INDIRECT COSTS			-	-	-	-	-	-	-	-	
11. TOTAL			974	809.5		1,783.5	24,261	35,299	59,560	6,571	

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT		NAME OF INFORMATION ANALYSIS CENTER Testing Information Analysis Center				Nondestructive		QUARTER ENDING	CUMULATIVE THRU 2/15/81 from 2/15/80
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED			COSTS INCURRED			INCOME	
		PRO- FESSIONAL	NON-PRO- FESSIONAL	TOTAL	DIRECT	INDIRECT	TOTAL		
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		1,790	1,424	3,214	49,389	64,463	113,852		
2. DOCUMENTS ACQUIRED									
3. DOCUMENTS REVIEWED									
4. DOCUMENTS CATALOGED									
5. TECHNICAL INQUIRY RESPONSES PROVIDED		18	-	18	83	303	386	158p	
6. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED		162	45	207	<1,529>	3,526	1,997	5,034	
7. HANDBOOKS/ DATA BOOKS COMPLETED		194	12	206	<190>	4,891	4,701	3,770	
8. NEW CHAPTERS/PAGES COMPLETED									
9. REVISED CHAPTERS/PAGES COMPLETED									
10. DATA SETS COMPILED									
11. STATE-OF-THE-ART STUDIES COMPLETED		185	137	322	<1,481>	6,167	4,686	7,628	
12. CRITICAL REVIEWS AND OR TECHNOLOGY ASSESSMENTS COMPLETED		23	21	44	<594>	930	336	3,704	
13. CURRENT AWARENESS AND PROMOTION EFFORTS		1,865.5	853.5	2,719	54,182	53,640	107,822	3,835	
14. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED									
15. NUMBER MEETINGS, CONFERENCES, LTC SUPPORTED									
16. OTHER		-	-	-	-	-	-	-	
17. MANAGEMENT AND SUPPORT		663	510	1,173	17,799	21,424	39,363		
18. UNASSIGNABLE INDIRECT COSTS		-	-	-	-	-	-		
19. TOTAL		4,900.5	3,002.5	7,903	117,799	155,344	273,143	24,129	

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT		NAME OF INFORMATION ANALYSIS CENTER Testing Information Analysis Center				Nondestructive		QUARTER ENDING	CUMULATIVE THRU 15 February 1981
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED			COSTS INCURRED			INCOME	
		PRO- FESSIONAL	NON-PRO- FESSIONAL	TOTAL	DIRECT	INDIRECT	TOTAL		
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		3,892	2,553	6,445	83,079	108,077	191,156		
a. DOCUMENTS ACQUIRED	7,200								
b. DOCUMENTS REVIEWED	7,200								
c. DOCUMENTS CATALOGED	5,427								
2. TECHNICAL INQUIRY RESPONSES PROVIDED	33	35	2	37	158	619	777	324	
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED	59	334	102	436	<1,290>	6,856	5,566	9,006	
4. HANDBOOKS/DATA BOOKS COMPLETED		615	32	647	1,159	14,440	15,599	13,356	
a. NEW CHAPTERS/PAGES COMPLETED	-								
b. REVISED CHAPTERS/PAGES COMPLETED	-								
c. DATA SETS COMPILED	-								
5. STATE-OF-THE-ART STUDIES COMPLETED	3	507	231	738	2,938	15,494	18,432	11,524	
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED	-	316	246.5	562.5	5,354	10,369	15,723	5,149	
7. CURRENT AWARENESS AND PROMOTION EFFORTS		4,133.5	1,677	5,810.5	126,846	114,611	241,457	4,225	
a. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED	106,740								
b. NUMBER MEETINGS, CONFERENCES, ETC SUPPORTED	22								
9. OTHER	-	-	-	-	-	-	-	185,058	
9. MANAGEMENT AND SUPPORT		1,351	1,510.5	2,861.5	38,997	46,609	85,586		
10. UNASSIGNABLE INDIRECT COSTS		-	-	-	-	-	-		
11. TOTAL		11,183.5	6,354	17,537.5	257,221	317,075	574,296	228,642	